

CLAIMS

1. Process for making microcapsules containing an aqueous solution of a hydrophilic protein having a plurality of free amine groups, characterized in that an emulsion of the aqueous solution is formed as the disperse phase in a liquid hydrocarbon which is a non-solvent for the protein and which is substantially non-polar or which has a polarity less than that of a 4:1 w/w mixture of cyclohexane and chloroform as the continuous phase, and a solution of a compound containing a plurality of groups capable of reacting with amine groups to form a polymer is added to the resulting emulsion, so that an interfacial condensation polymerization reaction occurs between the protein and the said compound to form microcapsules with a wall consisting substantially completely of crosslinked protein.
2. Process according to Claim 1, characterized in that the protein is a protein having a substantially linear structure.
3. Process according to either of Claims 1 and 2, characterized in that the protein is a globular protein and has been modified by breaking down, at least partially, the tertiary amine structure thereof.
4. Process according to one of Claims 1 to 3, characterized in that the protein is a naturally occurring protein.
5. Process according to one of Claims 1 to 4, characterized in that the protein contains a relatively high proportion of amino acids containing two amine groups or contains at least some amino acids in the form of their amides.

6. Process according to one of Claims 1 to 5, characterized in that the protein is present in the form of a component of a complex mixture of naturally occurring materials.

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7. Process according to Claim 6, characterized in that the mixture is whole egg, egg yolk, denatured whey, full cream condensed milk or fish roe.

10 8. Process according to Claim 7, characterized in that the fish roe is cod roe.

9. Process according to one of Claims 1 to 5, characterized in that the protein is hemoglobin.

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10. Process according to one of Claims 1 to 9, characterized in that, in addition to protein, or protein-containing material, the encapsulated aqueous phase contains other components that do not participate in the polymerization reaction.

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11. Process according to one of Claims 1 to 10, characterized in that the aqueous protein solution has a concentration of at least 20% by weight.

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12. Process according to one of Claims 1 to 11, characterized in that the compound that is reacted with the protein is an acid chloride, an acid anhydride or a dibasic or polybasic carboxylic acid.

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13. Process according to Claim 12, characterized in that the compound is sebacoyl chloride, adipoyl chloride, terephthaloyl chloride, or succinic anhydride.

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14. Process according to one of Claims 1 to 13, characterized in that the compound is a polyisocyanate and in that the aqueous protein solution also contains a catalyst for a polyurea-forming reaction.

15. Process according to Claim 14, characterized in that the polyisocyanate is diphenylethane diisocyanate.
- 5 16. Process according to either of Claims 14 and 15, characterized in that the catalyst is dimethylethanolamine.
- 10 17. Process according to one of Claims 1 to 16, characterized in that the liquid of the continuous phase is cyclohexane, n-decane, or 40/60 petroleum ether.
- 15 18. Process according to one of Claims 1 to 17, characterized in that, after termination of the reaction, the capsules are separated from the continuous phase and dispersed in water.
- 20 19. Process according to Claim 18, characterized in that a surface active agent is present to assist the dispersion in water.
- 25 20. Process according to Claim 19, characterized in that the material with surface activity is a non-detergent compound.
- 30 21. Process according to Claim 20, characterized in that the material with surface activity is a protective colloid.
22. Process according to Claim 21, characterized in that the said protective colloid is polyvinyl alcohol or gelatin.
- 35 23. Process according to Claim 20, characterized in that the surfactant is lecithin or an ester of a glyceride.

24. Process according to one of Claims 18 to 23, characterized in that a solute is present in the water in sufficient amount to balance the osmotic pressure inside and outside the capsules.

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25. Microcapsules having a crosslinked protein wall, prepared via a process according to one of Claims 1 to 24.